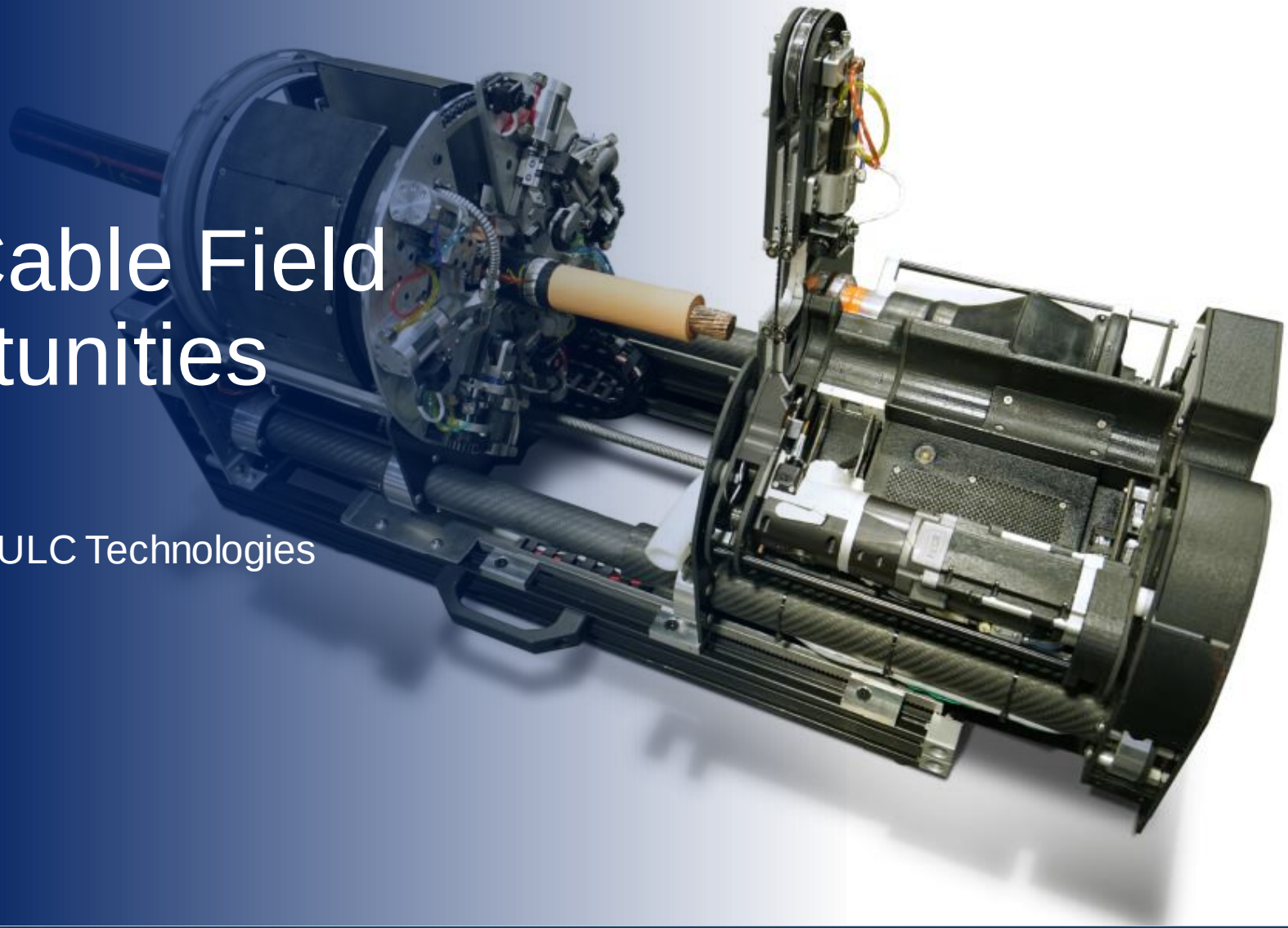
Automated MV Cable Field Splicing – Opportunities and Challenges

Jon Kuriloff, R&D Project Manager at ULC Technologies



July 19, 2022

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About Us

ULC Technologies combines excellence in research and development engineering with a strong field services capability to build and deliver advanced robotic systems, machine learning, technology and inspection systems for the energy, utility, renewables and industrial sectors.

- 20+ years of experience in the development and commercialization of robotics for utility and industrial markets
- Proven ability to conceptualize, prototype, test and commercialize complex robotic systems and technology
- Ability to support commercial deployment via contracted services, manufacturing, training, repair and customer support

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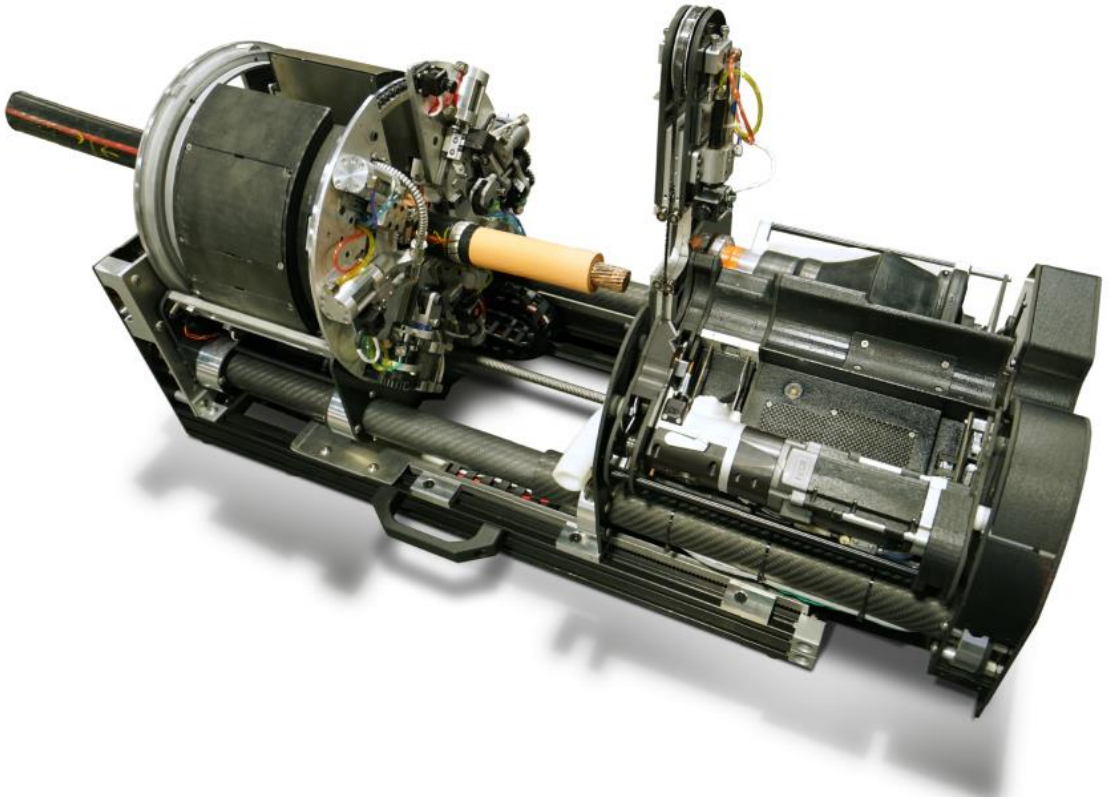
Medium Voltage Cable End Cap Machine



- ULC Technologies and Con Edison have developed and demonstrated a proof-of-concept system capable of performing complex operations on medium voltage feeders in underground vaults
- The MV Cable End Cap Machine was developed with the following key benefits:
  - **Improve worker safety**
  - **Reduce duration of feeder outage**
  - **Compact machine size**
  - **Improve repeatability**
  - **Minimize stress and risk**
  - **Versatile and expandable system**

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OPPORTUNITIES AND CHALLENGES

1. Variations in cable and splice types
2. Playing to the strengths of machines
3. Designing for real-world conditions

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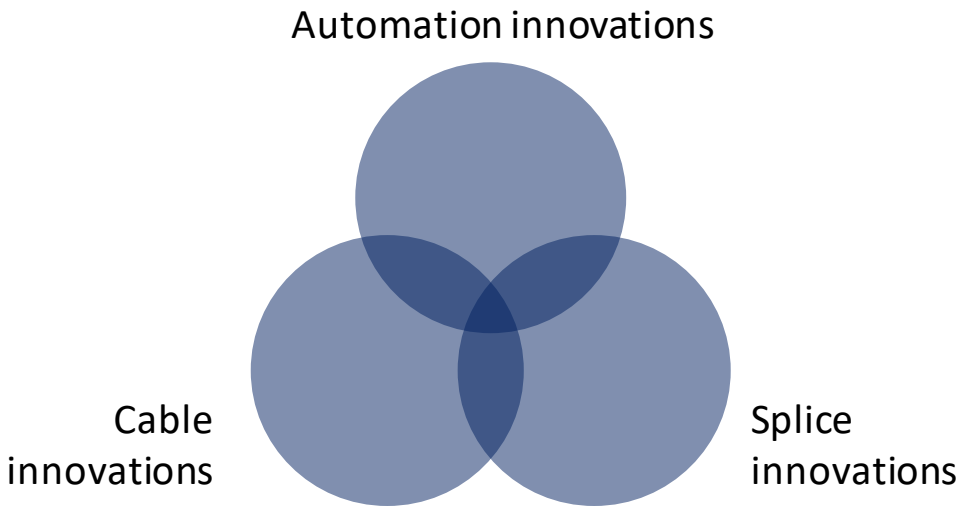
1. Variation in Cable & Splice Types

Source: 3M Power Cable Splicing and Terminating Guide

- Developing automation to fit the existing landscape of products makes the problem more complex than it needs to be
- How can we update cable and splice designs to better facilitate automation?



2. Playing to the Strengths of Machines

Some processes are easy for humans to perform and incredibly hard for machines

- "Soft" materials; uncontrolled surfaces
- High degree of dexterity required
- Many input materials
- Many discrete process steps

How can we lean into automation by:

- Working with controlled surfaces?
- Minimizing input materials?
- Minimizing process steps?
- Improving repeatability / reliability?

Source: Thorne & Derrick, Youtube

Source: 3M Canada, Youtube

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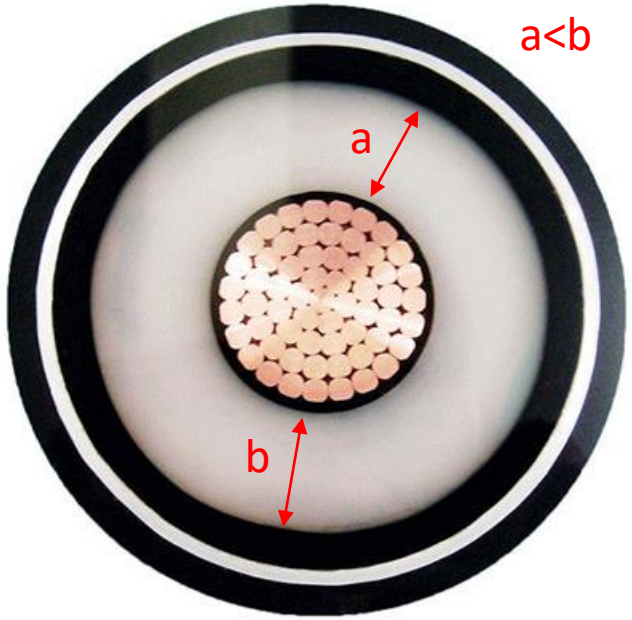
3. Designing for Real-World Conditions

Cable isn't straight	Cable layers aren't concentric	Space constraints, dust/debris



Practical solutions must reliably address these realities

Thank you for listening

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July 19, 2022